A FOLLOW-UP STUDY OF COMPUTER MAINTENANCE GRADUATES, 1965 AND 1966, FROM IOWA TECH, OTTUMWA

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by

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CHAPTER I

INTRODUCTION

The steam engine, which set off the First Industrial Revolution is far less revolutionary than the computer, which has launched the Second.[1] The First Industrial Revolution did not arrive to many parts of the world until the late 19th or early 20th centuries, while England had become part of this Revolution in the late 18th century.

There are about 35,000 computers in use, with some 27,000 of this total in the United States. It has been estimated that there will be 85,000 in use in the world by 1975.[2]

Very few countries of the world today cannot claim at least one computer in use in their nation.

"It will be the next truly great international industry--after oil and automobiles," commented Jacques G. Maisonrouge, vice-president for European operations at International Business Machines' World Trade Corporation in Paris.[3]

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[1]George T. Harris, "Automation, We Can Handle It," Look Magazine (January 12, 1965), 59.

[2]T. A. Wise, "IBM's $5,000,000 Gamble," Fortune, LXXIV (September, 1966), 19.

[3]"The $5-billion World Market for Computers," Business Week (February 19, 1966), 110.

> Right now every man, woman, and child in the United States is represented in the memory of one or more electronic digital computers as either a name, number, or statistic.[1]

The Census Bureau was the first government user of the computer. Since 1950, it has performed more than 510 billion mathematical operations in a one year span keeping pace with our exploding population.

Nearly all facets of our lives are influenced to some degree by the computer. This may involve the checking of our income tax returns by the government; the assembling of the proper ingredients for the ice cream or bologna we purchase at the supermarket; our garbage being removed on schedule thanks to a programmed schedule for proper truck usage; and more accurate long-range forecasting weather predictions.

A virtually "cashless" economy in the future has been predicted by former Telephone Laboratories scientist Hubert Heffner, now associate provost and dean for research at Stanford University. Using a number, verified perhaps by a thumb print, will be all that is required to make a purchase. A computer will automatically check the customer's bank account, debit the proper amount, and credit the seller's account at the same time.[2]

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[1] Stanley L. Englebardt, Computers (New York: Pyramid Publications, 1962), p. 7.

[2] "The Wondrous World of 1990," U.S. News & World Report, LXII (January 30, 1967), 62-66.

With all the possible blessings derived from such a system, there may be certain negative effects which would be present. Wallich has warned of the possible invasion of privacy. "To have all one's financial affairs known to the machine is not completely comfortable in any event. Investigators other than credit men will be interested."[1] Wallich envisioned a type of police state where a person's whole history could be stored by the "authorities."

I. THE PROBLEM

Statement of the problem. It was the purpose of this study to acquire information from Iowa Tech graduates, Ottumwa, Iowa, in computer maintenance, 1965-1966, regarding: where they are employed; the number of jobs held and their salaries; the amount of additional training received; their ratings of preparation received at Iowa Tech as compared to other employees in the same industry with similar training; how they obtained their present job; their knowledge of Iowa Tech prior to enrollment; and whether they are employed in the computer maintenance area. Six graduated classes were involved in the follow-up.

Reason for the study. Iowa Tech had the distinction of being the first vocational technical school to start

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[1] Henry C. Wallich, "Big Brother Computer," Newsweek, LXVIII (July 25, 1966), 80.

under the federal Manpower Development and Training Act of 1962. Programs under the Manpower Act started at Iowa Tech on July 1, 1964. The institution was designated an area school under legislation passed in 1965 by the 61st General Assembly of Iowa.

In order for an educational institution to improve itself and improve the services to its students and graduates, the follow-up must become an important part of the school. However, the follow-up should not be limited to an evaluation of the program and of the student. It is a means of helping the graduate adjust to his new work situation, and occasionally help him to try again.

Arbuckle wrote, "The best placement service will make its mistakes, and students will be placed in positions that they never should have been asked to accept."[1] Commenting further on the responsibility of the institution, Arbuckle felt that it was their duty to help the graduate by giving him another chance.[2]

Hoppock stated:

> The major purpose of the follow-up is to give the student a more realistic picture of their future by helping them to find out what has happened to who preceded them.[3]

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[1] Dugald S. Arbuckle, Student Personnel Services in Higher Education (New York: McGraw-Hill Book Company, Inc., p. 116.

[2] Ibid.

[3] Robert Hoppock, Occupational Information (New York: McGraw-Hill Book Company, Inc., 1957), p. 202.

Wrenn wrote that the follow-up may be considered to have two main purposes:

1. Individual student follow-up to assist the individual in his job adjustment; and
2. More general follow-up to secure information regarding former students, alumni reactions, and job conditions that will be useful in educational planning.[1]

A third subsidiary function was also listed by Wrenn:

> A fulfillment of the first objective, service to the former, will inevitably result in at least two more satisfied customers--the former student and the employer.[2]

Importance of the study. Walter M. Arnold, Assistant Commissioner, Vocational Education, U. S. Office of Education, stated in 1964:

> There is little doubt that what we do in the area of technical education is going to have a direct bearing on how well this nation adapts to the continuing changes and multiplying demands upon our human resources.

The Manpower Development and Training Program of 1962 accepts automation with its changing technological developments and attempts to prepare labor to meet the challenge by training underemployed and unemployed workers for jobs that are available in the future.

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[1] Gilbert C. Wrenn, Student Personnel Work in College (New York: The Ronald Press, 1951), pp. 405-406.

[2] Ibid., p. 406.

[3] Walter M. Arnold, "A Look Ahead in Technical Education," American Vocational Journal, XXXIX (April, 1964), 12.

In general, the Manpower Development and Training Act requires the Secretary of Labor to conduct regular and intensive research activities in the employment areas to determine skill requirements, job opportunities, and employment trends. This information is submitted to the President who reports to Congress on manpower requirements, resources, utilization, and training.

During Manpower's first year of operation more than sixty thousand persons were enrolled in its training programs: during 1966 it was hoped that more than two hundred thousand persons would receive assistance.[1]

Automation with its many blessings may for some be a temporary evil. On an existing job it cuts the number of workers and often lowers the skills required. "Its easy to punch a button, but many workers have to move on," wrote Harris.[2]

During the 1960's, the population of the United States is expected to increase by 28 million, or 15 per cent. During the same period the labor force is expected to increase by 13.5 million or 20 per cent.[3]

The population of the United States and the labor force in particular are increasingly mobile in where they live

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[1] Grant Veen, Man, Education, and Work (Washington, D.C.: American Council on Education, 1965), p. 129.

[2] Harris, loc. cit.

[3] Ibid.

and work. In a recent year more than eighteen million different workers changed jobs. In that same year there were 11.5 million job changes, two-thirds of which were to completely different industries, and one-half to a completely different occupational category. Nearly half of the people in the United States have changed their residence during the last five years, a fifth of them to a different state. The most frequent cause of residence change was employment opportunity.[1]

Job change among younger workers is two and a half times more frequent than among older workers. Young workers in the unskilled and semi-skilled areas are the most susceptible to layoffs and firings. The high turn-over rate in blue-collar occupations is related to the impact of technology on the employment of factory operatives and laborers. Skilled, technical, managerial, and professional workers typically change jobs in a purposeful advancement to a better position in the same or a closely related field of work while blue-collar workers and younger workers often shift from one type of job to another.

Commenting on the personnel needs of industry, Venn stated:

> Not only do we need more people moving into skilled and technical occupations but the right kind of people;

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[1] Ibid., p. 130.

> not potential engineers, not potential mechanics, but those whose ability and aptitude suit them best for this level of work.[1]

II. LIMITATIONS OF THE STUDY

Sampling. Responses were received from fifty people who graduated from Iowa Tech, Ottumwa, Iowa, in computer maintenance, 1965 and 1966. This was a 69 per cent return from the 73 graduates.

Baier and Roeber have reviewed several researchers on bias in follow-up returns. These researchers suggested that incomplete returns are liable to be weighed with proportionately more replies from certain groups which tend to respond more readily than their opposites. The groups that tended to respond to older graduates and students near the top of their class in school grades as opposed to students near the bottom.[2]

The questionnaire. "The limitations of words are particular hazards in the questionnaire. The same words mean different things to different people," commented Best.[3]

The questions pertaining to the rating of preparation as compared to other employees in the same industry with

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[1] Venn, op. cit., p. 135.

[2] Hoppock, op. cit., p. 209.

[3] John W. Best, Research in Education (New York: Prentice-Hall, 1959), p. 146.

similar training should have limited the choice of response to "adequate" and "inadequate".

Another limitation was the amount of information sought. Additional questions might have been added to the questionnaire. However, additional length of a questionnaire can lead to an unfavorable reaction by the intended respondent who might discard it or leave certain questions unanswered.

III. REVIEW OF LITERATURE

Information regarding follow-up studies of post-high school vocational-technical and area vocational school graduates is quite limited. A brief summary of the work done in this area will be given.

Coyle identified some of the differences existing between high school vocational training and post-high school vocational training. These differences were as follows:

1. The post-high school student is usually a few years older than the high school student. He has probably reached full physical growth and may have solved some of the psychological problems of adolescence. The high school student is more self-centered, objectives less well established and has less perspective of the future.
2. High school makes more rigorous demands on the student. Post-high school is concerned only with training for an occupation and has less time for the humanities or general education.
3. High school technician training must be general around a cluster of jobs. Post-high school should be for specific employment.

4. Organizational pattern of high school is more complicated and the technical part of the school is very apt to conflict with the philosophy of the rest of the school regarding time, schedules, etc.[1]

Malone in a study of students enrolled in public post-high school vocational programs, which included Iowa Tech, during the 1964-1965 school year found that the majority of the students were unmarried (77.4 per cent).[2] This compared with a majority (84 per cent, Table III) of computer maintenance graduates who were married. Malone also found that a majority (67.5 per cent) of the students were under the age of twenty-one.[3] Only 6 per cent of the 1965 and 1966 graduates in computer maintenance (Table IV) were under age 21.

In Malone's study, he found that 78.8 per cent of the students would speak very highly or at least favorably of their school to potential enrollees still in high school; of the remaining 21.2 per cent, a minority of students said they would give a very low rating.[4]

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[1] F. J. Coyle, "Technical Training: Differences Between Two Levels," School Shop, XXI (October, 1961), 53.

[2] Francis E. Malone, "A Study of Students in Post-High School Public Vocational Education Programs in Iowa During 1964-1965 (unpublished Ph.D. thesis, State University of Iowa, 1965), p. 113.

[3] Ibid.

[4] Ibid.

Schultz pointed out in a study of post-high school vocational and technical schools that the graduate preferred to stay in the local area if possible.[1] Only 28 per cent of the computer maintenance graduates (Table II) were found to be employed in Iowa.

Schultz also found that placement of graduates was considered an important function in fifteen vocational and technical schools. All maintained contacts with representatives of the occupational area and the majority of the graduates were placed through these contacts. According to the administrators, few graduates obtained jobs solely through their own efforts.[2] Sixty-six per cent of computer maintenance graduates obtained their present job through the school.

Pearson conducted a study of specialty school graduates at Salt Lake Area Vocational Schools in Utah. In the first study of twenty-eight automobile mechanic graduates, Pearson found that 28.6 per cent of the former students were working as automobile mechanics, 53.6 per cent at other jobs,

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[1] Richard Henry Schultz, "Study of Fifteen Public Post-High School Vocational and Technical Schools in Iowa During the 1964-1965 School Year," (unpublished Master's thesis, State University of Iowa, 1966), p. 42.

[2] Ibid.

and 17.8 per cent were unemployed.[1] A similar study by Pearson of twenty-three electricity students showed 47.8 per cent of the former students were employed in the electrical trades, 43.5 per cent at other jobs, and 8.7 per cent were unemployed.[2] Ninety-eight per cent of computer maintenance graduates were employed (Tables V and XX). Seventy-six per cent of the graduates were employed in the computer maintenance area, 14 per cent in a related area, 8 per cent not in the area, and 2 per cent unemployed (Table XX).

IV. PROCEDURE

Questionnaires (appendix A) were mailed to seventy-three graduates, 1965 and 1966, in computer maintenance, from Iowa Tech, Ottumwa, Iowa, during the first week of January, 1967. All of the graduates had their forty-eight weeks of training under the Manpower Development and Training Act.

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[1] David T. Pearson, "Follow-up of Automobile Mechanic Students," (1956 Salt Lake Area Vocational School), Research in School and College Personnel Services, Summaries of Unpublished Studies, U.S. Department of Health, Education and Welfare, Office of Education, Bulletin 1960, No. 10 (Washington, D.C.: Government Printing Office, 1960), pp. 44-45.

[2] David T. Pearson, "Follow-up of Electricity Students," (1957 Salt Lake Area Vocational School), Research in School and College Personnel Services, Summaries of Unpublished Studies, U. S. Department of Health, Education and Welfare, Office of Education, Bulletin 1960, No. 10 (Washington, D.C.: Government Printing Office, 1960), p. 45.

In preparing the questionnaire, both Donald Palmer, a guidance counselor at Iowa Tech, and Bernard Terrill, Coordinator of the Computer Maintenance Division at Iowa Tech were consulted as to what information the school needed which could be obtained by means of a questionnaire.

A cover letter (Appendix B) was prepared explaining the purposes of the follow-up was enclosed, along with a self-addressed stamped envelope for the return. Each student prior to graduation had been informed that the school would be contacting him from time to time.

Two weeks after the initial mailing, a post card reminder (Appendix C) was sent to the graduates requesting them to complete the form and return it if they had not already done so.

For the first five weeks, the returns came in at a steady rate. After that they tapered off. The last form was received the first week of March. Fifty questionnaires out of the original seventy-three sent were returned for a 69 per cent response (Table I).

CHAPTER II

THE QUESTIONNAIRE RESULTS

Results in this chapter were based upon the response given to a questionnaire by fifty graduates (seventy-three were sent), 1965 and 1966, in computer maintenance, from Iowa Tech, Ottumwa, Iowa.

Table I shows that the percentage responding to the questionnaire varied from 58 per cent in class 2, to 92 per cent in class 6, which was the last graduated class to take part in the follow-up. Surprisingly, the next best response was by the first graduating class. The total response was 69 per cent.

TABLE I

RESPONSE TO THE QUESTIONNAIRE BY CLASS AND PERCENTAGE

Class	No. Sent To Graduates	No. Returned	Class Return Percentage
1	11	8	73
2	12	7	58
3	15	9	60
4	13	9	69
5	10	6	60
6	12	11	92
Total	73	50	69

Table II shows that 28 per cent of the graduates are employed in Iowa. The state in which the next highest percentage were employed is Texas with 14 per cent. Both Minnesota and Illinois employed 10 per cent of the graduates.

TABLE II

GEOGRAPHICAL LOCATION OF EMPLOYMENT OF COMPUTER MAINTENANCE GRADUATES BY NUMBER AND PERCENTAGE

Location	1 Class	2 Class	3 Class	4 Class	5 Class	6 Class	Per Cent
Armed Forces	-	1	-	-	-	1	4
Alabama	-	-	-	1	-	-	2
California	-	-	-	1	1	-	4
Colorado	-	1	-	-	-	1	4
Florida	-	-	-	-	1	-	2
Illinois	-	-	3	2	-	-	10
Iowa	5	-	3	1	2	3	28
Kansas	-	-	-	-	-	1*	2
Michigan	-	-	-	1	-	-	2
Minnesota	-	1	-	-	1	3	10
Missouri	-	-	1	-	-	-	2
Nebraska			1	1	-	-	6
Nevada	-	-	-	-	1	-	2
New York	-	-	1	-	-	-	2
Oklahoma	-	-	-	2	-	-	4
Texas	3	2	-	-	-	2	14
Wisconsin	-	1	-	-	-	-	2

*unemployed

The four states of Iowa, Minnesota, Texas, and Illinois employed over half of the computer maintenance graduates in their states (see Table II).

Table III shows that 84 per cent of the graduates responding were married, 14 per cent single, and 2 per cent were divorced. All of the graduates from classes 3 and 4 were married, whereas only 6 out of 11 from class 6.

TABLE III

MARITAL STATUS SHOWN BY NUMBER AND PERCENTAGE

Marital Status	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Married	7	6	9	9	5	6	84
Single	1	1	-	-	1	4	14
Divorced	-	-	-	-	-	1	2

Eighty-six per cent of the graduates were between the ages of 21 and 40 as shown by Table IV. Only 6 per cent were under 21 years of age and only 6 per cent were over 40. More than half (56 per cent) were under age thirty. The range for the 49 who responded to this question was from ages 19 to 46. Class 1 ranged in age from 24 to 46, class 2 from 20 to 37, class 3 from 22 to 41, class 4 from 26 to 38, class 5 from 21 to 38, and class 6 from 19 to 41.

TABLE IV

AGE RANGE SHOWN BY NUMBER AND PERCENTAGE

Age	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
19	-	-	-	-	-	2	4
20	-	1	-	-	-	-	2
21	-	-	-	-	1	1	4
22	-	-	1	-	-	-	2
23	-	1	1	-	-	1	6
24	1	-	-	-	1	-	4
25	2	-	1	-	-	1	8
26	-	-	-	1	1	1	6
27	-	-	-	-	-	1	2
28	1	1	-	2	-	-	8
29	-	1	1	1	-	1	8
30	1	1	1	-	-	-	6
31	-	-	1	1	1	-	6
32	-	1	-	-	-	1	4
33	1	-	1	-	-	-	4
34	-	-	-	1	-	1	4
35	-	-	1	-	-	-	2
36	-	-	-	-	1	-	2
37	-	1	1	-	-	-	4
38	-	-	-	1	1	-	4
39	1	-	-	-	-	-	2

TABLE IV (continued)

Age	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
40	-	-	-	-	-	-	-
41	-	-	-	1	-	1	4
42	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-
46	1	-	-	-	-	-	2
No Response	-	-	-	1	-	-	2

Table V indicates that 78 per cent of the graduates of Iowa Tech were employed in their first job, 16 per cent have been employed in their second job location, 4 per cent in their third, and only 2 per cent were unemployed.

TABLE V

NUMBER OF JOBS AS SHOWN BY CLASS AND PERCENTAGE

Job	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
First	4	4	8	5	8	10	78
Second	2	1	1	4	-	-	16
Third	1	1	-	-	-	-	4
Un-employed	-	-	-	-	-	1	2

As the purpose of the Manpower Development and Training Act was to establish training programs for unemployed and underemployed persons, 98 per cent of the graduates in computer maintenance have fully benefitted from this program as they are now employed.

Table VI shows that the salary range of the first job held since graduation varied from between $300-349 up to a high of over $700 per month. Eighty-eight per cent of the

TABLE VI

SALARY RANGE OF FIRST EMPLOYMENT BY CLASS AND PERCENTAGE

Salary Range per month	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Less than $300	-		-	-			
300-349	1	1	-				4
350-399	1	-	-		-	-	2
400-449	2			-	1	-	8
450-499	-	-	2	2		5	18
500-549	-	3	4	2	2	-	22
550-599	1	1	-	3	2	3	20
600-649	2	1	1	2	1	1	16
650-699	1		-	-		-	2
Over $700-				1		-	2
Not reported	-		1	-	-	1	4
Not employed	-	-	-	-	-	1	2

graduates on their first job earned $400 or more per month. Only 6 per cent were under this figure. No one earned less than $300 per month. The lowest salary for class 6 was $450-499 per month; the highest was $600-649 per month. Only one person in the last four classes earned less than $450-499 per month (between $00-449). Competition for employment of computer maintenance personnel is one reason that the initial salary offerings have increased.

Table VII shows that the lowest salary earned by a graduate changing to a second job was $300-349 per month; the highest salary was in the $650-699 range. Only eight graduates had changed to at least a second job.

TABLE VII

SALARY RANGE OF SECOND EMPLOYMENT

Salary Range per month	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
$300-349	-	1	-	-	-	-
350-399	1	-	-	-	-	-
400-449	-	-	-	-	-	-
450-499	1	-	-	-	-	-
500-549	-	-	-	-	-	-
550-599	-	-	-	3	-	-
600-649	-	-	1	-	-	-
650-699	1	-	-	-	-	-

The salary range of the two respondents who reported as employed on their third job since having been graduated was $300-349 and $400-449 per month as shown in Table VIII.

TABLE VIII

SALARY RANGE OF THIRD EMPLOYMENT

Salary range per month	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
$300-349	-	1	-	-	-	-
350-399	-	-	-	-	-	-
400-449	-	1	-	-	-	-

From Table IX, 33 or 66 per cent of the respondents received additional training after having been graduated. Only 14 or 28 per cent received no further training. No response to this question was reported by 6 per cent.

TABLE IX

NUMBER OF GRADUATES RECEIVING ADDITIONAL TRAINING BY CLASSES AND PERCENTAGES

Additional training	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Received	3	5	6	7	5	7	66
None	5	1	3	2	1	2	28
No response	-	1	-	-	-	2	6

Table X shows that 9 per cent of those graduates receiving additional schooling received one to four weeks of additional training; 24 per cent received five to eight weeks; 37 per cent received nine to twelve weeks; 24 per cent received thirteen to twenty-four weeks; and 6 per cent took more than twenty-five weeks.

TABLE X

LENGTH OF ADDITIONAL TRAINING BY CLASSES AND PERCENTAGES

Length of additional training	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
1-4 weeks	1	-	-	1	1	-	9
5-8 weeks	1	4	2	-	-	1	24
9-12 weeks	-	-	1	3	2	6	37
13-24 weeks	1	-	3	2	2	-	24
More than 25 weeks	-	1	-	1	-	-	6

From Table XI 70 per cent of the graduates rated the mathematics preparation received as compared to other employees in the same industry with similar training as "excellent" or "good", and only 6 per cent rated it "below average". No one gave the course a "poor" rating. In classes 3 through 6 no one responded with "below average" or "poor".

TABLE XI

RATING OF PREPARATION IN MATHEMATICS AS COMPARED TO OTHER EMPLOYEES IN THE SAME INDUSTRY WITH SIMILAR TRAINING

Mathematics	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Excellent	2	2	5	6	2	3	40
Good	-	4	2	3	3	3	30
Average	2	-	2	-	1	3	16
Below Average	2	1	-	-	-	-	6
Poor	-	-	-	-	-	-	--
No response	2	-	-	-	-	2	8

From Table XII 50 per cent rated their preparation in the electronics course as "excellent" or "good" when

TABLE XII

RATING OF PREPARATION IN THE ELECTRONICS COURSE AS COMPARED TO OTHER EMPLOYEES IN THE SAME INDUSTRY WITH SIMILAR TRAINING

Electronics	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Excellent	1	-	3	1	-	-	10
Good	1	4	2	6	3	4	40
Average	3	2	3	2	3	4	34
Below Average	-	1	1	-	-	1	6
Poor	-	-	-	-	-	-	--
No response	3	-	-	-	-	2	10

compared to other employees in the same industry with similar training. Forty per cent gave the course a "good" rating. Only 6 per cent rated the course as "below average". There were no "poor" ratings.

A rating of either "excellent" or "good" was given by 68 per cent of respondents (Table XIII) to the computer logic preparation when compared to other employees in the same industry with similar training. "Below average" was the response given by 4 per cent and "poor" by 2 per cent.

TABLE XIII

RATING OF PREPARATION IN COMPUTER LOGIC AS COMPARED TO OTHER EMPLOYEES IN THE SAME INDUSTRY WITH SIMILAR TRAINING

Computer Logic	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Excellent	2	4	2	3	2	3	32
Good	2	3	2	6	3	2	36
Average	2	-	3	-	1	3	18
Below Average	-	-	1	-	-	1	4
Poor	-	-	1	-	-	-	2
No Response	2	-	-	-	-	2	8

As shown by Table XIV, 48 per cent rated unit record preparation as either "excellent" or "good", when compared to other employees in the same industry with similar training, while 32 per cent have an "average" rating. Four per cent

rated the preparation "below average" and 6 per cent as "poor".

TABLE XIV

RATING OF PREPARATION IN UNIT RECORD MAINTENANCE AS COMPARED TO OTHER EMPLOYEES IN THE SAME INDUSTRY WITH SIMILAR TRAINING

Unit record maintenance	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Excellent	1	-	1	1	1	1	10
Good	1	4	2	6	2	4	38
Average	3	3	2	2	2	4	32
Below Average	-	-	1	-	1	-	4
Poor	-	-	-	-	-	-	-
No Response	3	-	-	-	-	2	10

Table XV shows that 52 per cent rated their preparation in communication skills as "excellent" or "good" when compared to other employees in the same industry with similar training. Thirty-eight per cent gave it an "average" rating. Only 2 per cent rated the preparation "below average", and there were no "poor" responses.

TABLE XV

RATING OF PREPARATION IN COMMUNICATION SKILLS AS COMPARED TO OTHER EMPLOYEES IN THE SAME INDUSTRY WITH SIMILAR TRAINING

Communication Skills	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Excellent	1	2	2	4		1	20
Good	-	2	3	2	4	5	32
Average	5	2	4	3	2	3	38
Below Average	-	1	-	-		-	2
Poor	-	-	-	-	-	-	-
No Response	2	-	-	-	-	2	8

According to Table XVI, 64 per cent rated their computer programming preparation an "excellent" or "good"

TABLE XVI

RATING OF PREPARATION IN COMPUTER PROGRAMMING AS COMPARED TO OTHER EMPLOYEES IN THE SAME INDUSTRY WITH SIMILAR TRAINING

Computer Programming	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Excellent	2	2	3	3	1	4	30
Good	2	3	1	4	-	3	34
Average	2	2	4	1	1	1	20
Below Average	-	-	-	1	-	1	4
Poor	-	-	-	1	-	-	3
No Response	2	-	1	-	-	2	10

when compared to other employees in the same industry with similar training. "Below average" was the response given by 4 per cent; 2 per cent responded "poor".

From Table XVII, 44 per cent rated their computer related lab preparation as either "excellent" or "good" when compared to other employees in the same industry with similar training. Thirty-eight per cent gave an "average" rating; only 6 per cent rated it "below average".

TABLE XVII

RATING OF PREPARATION IN THE COMPUTER RELATED LAB AS COMPARED TO OTHER EMPLOYEES IN THE SAME INDUSTRY WITH SIMILAR TRAINING

Computer Related Lab	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Excellent	1	2	2	2	-	-	14
Good	1	4	1	3	4	2	30
Average	4	1	5	3	2	4	38
Below Average	-	-	-	1	-	2	6
Poor	-	-	-	-	-	-	-
No Response	2	-	1	-	3	-	12

From Table XVIII, 36 per cent of the graduates acquired their present job through the school, 16 per cent through either a state or private employment agency, 4 per cent with a friend's help, and 10 per cent through other

TABLE XVIII

METHOD OF ACQUIRING PRESENT JOB

Source	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
School	1	4	7	7	6	8	66
Friends	-	-	-	1	-	1	4
Employment Agency	1	-	1	-	-	-	4
State Agency	2	-	-	1	-	-	6
Newspaper Ad	-	-	1	-	-	-	2
Armed Forces	-	1	-	-	-	1	4
Other	3	2	-	-	-	-	10
Unemployed	-	-	-	-	-	1	2
No Response	1	-	-	-	-	-	2

Table XIX indicated that only 40 per cent of the respondents felt that they had sufficient knowledge of Iowa Tech and its curriculum prior to enrollment. The "no" response was given by 44 per cent. Table XIX shows that there was little improvement between class 1 and class 3 in this area.

TABLE XIX

PERCENTAGE SHOWING WHETHER THE RESPONDENTS HAD SUFFICIENT KNOWLEDGE OF IOWA TECH AND ITS CURRICULUM PRIOR TO ENROLLMENT

Sufficient Knowledge	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
Yes	3	2	3	5	2	5	40
No	5	4	5	4	4	5	54
No Response	-	1	1	-	-	-	6

Seventy-six per cent (Table XX) of the Iowa Tech computer maintenance graduates, 1965 and 1966, were employed in the computer maintenance area, 14 per cent in a related area, and only 8 per cent were not in the area. This shows 2 per cent were unemployed. Ninety per cent of the graduates were either in the computer maintenance area or in a related area. This in itself attests to excellent training received at Iowa Tech.

TABLE XX

PERCENTAGE OF GRADUATES EMPLOYED IN THE COMPUTER MAINTENANCE AREA

Computer Maintenance	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Per cent
In Area	4	5	7	8	6	8	76
Related Area	3	1	2	-	-	1	14
Not in Area	1	1	-	1	-	1	8
Unemployed	-	-	-	-	-	1	2

CHAPTER III

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

It was the purpose of this study to acquire information from Iowa Tech graduates, 1965 and 1966, Ottumwa, Iowa, in computer maintenance regarding: where they are employed; the number of jobs held and their salaries; the amount of additional training received; their ratings of preparation received at Iowa Tech as compared to other employees in the same industry with similar training; how they obtained their present job; their knowledge of Iowa Tech prior to enrollment; and whether they are employed in the computer maintenance area. Six graduated classes were involved in the follow-up.

Questionnaires were sent to seventy-three graduates, 1965 and 1966, from the computer maintenance division of Iowa Tech, Ottumwa, Iowa. Fifty graduates or 69 per cent responded to the questionnaire. The percentage of response for the six classes varied from 58 to 92 per cent. Two weeks after the questionnaire was mailed to graduates during the first week of January, 1967, a post card reminder was sent.

Twenty-eight per cent of the respondents were employed inside the state of Iowa. Texas employed 14 per cent, Illinois and Minnesota 10 per cent each.

Eighty-four per cent of the graduates were married, 14 per cent were single, and only 2 per cent divorced.

The age range was from 19 to 46 years of age. Eighty-six per cent of the graduates were between the ages of 21 and 40.

Forty-nine out of the 50 respondents were employed. One job held since graduation was the response given by 78 per cent, two job changes rated 16 per cent, and only 4 per cent were employed on their third job.

The salary range of the first job held was from $300-349 to over $700 per month. Eighty-eight per cent earned over $400 or more per month on their first job. The salary range of those who had changed to a second job was $300-349 up to $650-699 per month. The salary range of the two respondents employed on their third job was $300-349 and $400-449 per month.

Additional training had been received by 66 per cent of the graduates. Of this 66 per cent, 85 per cent received additional training which lasted from 5 to 24 weeks.

Mathematics, when compared with the preparation of other employees in the same industry with similar training, was given a 70 per cent rating as either "excellent" or "good"; electronics, 50 per cent; computer logic, 68 per cent; unit record maintenance, 48 per cent; communication skills, 52 per cent; computer programmer, 54 per cent; and computer related lab, 44 per cent.

Iowa Tech helped 66 per cent of the computer maintenance graduates, 1965 and 1966, obtain their present employment.

Forty per cent felt that they had sufficient knowledge of Iowa Tech and its curriculum prior to enrollment, while 54 per cent responded with "no".

Ninety per cent of the graduates were either employed in the computer maintenance area (76 per cent) or in a related area (14 per cent).

I. CONCLUSIONS

The occupational status of the respondents was highly stable with only one person unemployed.

Since the Manpower graduates were either under-employed or unemployed before enrolling at Iowa Tech, it was evident from employment figures of the respondents that the computer maintenance program has made a commendable effort in turning out productive individuals. If one's salary is a criterion for success, then the graduates must be so considered. Only 6 per cent indicated a salary of less than $400 per month. Also, 90 per cent of the graduates were employed in the computer maintenance area or in a related area. These figures further attest to the quality of training which Iowa Tech offered.

Judging from the responses to the rating of preparation in seven areas of their course study, a large majority indicated their course preparation was average or better. These figures are thrown into a better prospective when one considers the relatively short existence for the school and its offerings.

The respondents were comparatively stable in the area of number of job changes since graduation. More than three-fourths were still employed on their first job.

A majority of the Iowa Tech graduates were employed outside the state of Iowa. Although many of the graduates were originally not from Iowa, this state is losing many prospective citizens by not having jobs available in the computer maintenance field.

The figures indicating that nearly two-thirds of the graduates received additional training might, without further insight, appear to show an inadequacy on the school's part. However, each company may prefer or require training on their own systems without regard to the caliber of prior training.

The one fault of Iowa Tech as indicated by this follow-up study was the lack of public knowledge of the school and its offerings.

II. RECOMMENDATIONS

The writer recommends that:

1. Follow-up studies be made in the future of all

graduated classes in computer maintenance.

2. Contact be continued with the six graduated classes that took part in the follow-up.
3. Greater effort should be made to inform the public of Iowa Tech and its curriculum.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE

Part 1. Please complete (print or type) Date_____

Name_____Student number_____

Present address_____Age_____

Permanent address_____

Marital status_____Are you now employed? Yes___No___

Part 2. First job held after leaving Iowa Tech.

1. Job title	2. Supervisor	3. Company

4. Location	5. Entry date	6. Termination date

7. Type of system used

Please check salary range:

1. Less than $300 a month ___
2. $300 to $349 a month ___
3. $350 to $399 a month ___
4. $400 to $449 a month ___
5. $450 to $499 a month ___
6. $500 to $549 a month ___
7. $550 to $599 a month ___
8. $600 to $649 a month ___
9. $650 to $699 a month ___
10. Over $700 a month ___

Part 3. Second job held after leaving Iowa Tech.

1. Job title	2. Supervisor	3. Company

4. Location	5. Entry date	6. Termination date

7. Type of system used

_____

Please check salary range:

1. Less than $300 a month	____	6. $500 to $549 a month	____
2. $300 to $349 a month	____	7. $550 to $599 a month	____
3. $350 to $399 a month	____	8. $600 to $649 a month	____
4. $400 to $449 a month	____	9. $650 to $699 a month	____
5. $450 to $499 a month	____	10. Over $700 a month	____

Part 4. Third job held after leaving Iowa Tech.

1. Job title	2. Supervisor	3. Company
_____	_____	_____
4. Location	5. Entry date	6. Termination date
_____	_____	_____

7. Type of system used

_____

Please check salary range:

1. Less than $300 a month	____	6. $500 to $549 a month	____
2. $300 to $349 a month	____	7. $550 to $599 a month	____
3. $350 to $399 a month	____	8. $600 to $649 a month	____
4. $400 to $449 a month	____	9. $650 to $699 a month	____
5. $450 to $499 a month	____	10. Over $700 a month	____

Did you take additional schooling in your field after leaving Iowa Tech? Yes_____ No_____

Where?_____

How long?

1. 1-4 weeks _____
2. 5-8 weeks _____
3. 9-12 weeks_____
4. 13-24 weeks_____
5. More than 25 weeks _____

How adequate do you rate your preparation as compared to other employees in the same industry with similar training in the following Fields:

1. Mathematics Excellent____ Good____ Average_____
   Below average_____ Poor_____

2. Electronics Excellent____ Good____ Average_____
   Below average_____ Poor_____

3. Computer logic Excellent_____ Good_____Average_____
   Below average_____ Poor_____

4. Unit record maintenance Excellent_____ Good_____
   Average_____ Below average____
   Poor_____

5. Communication skills Excellent_____ Good_____
   Average_____ Below average_____
   Poor_____

6. Computer programming Excellent_____ Good_____
   Average_____ Below average_____
   Poor_____

If you are not employed in your training field, do you feel you have enough training to get a job in this area if desired? Yes_____ No_____ If NO, do you wish assistance from this school in obtaining a job?_____

How did you get your present job?

School_____ State employment_____
Friends_____ Nespaper ad_____
Employment agency____ Other_____

Did you have sufficient knowledge of Iowa Tech and its curriculum before enrolling?

Yes_____ No_____

Please write any comment you wish to express that may improve the school such as type of courses, changes in schedule, or new subjects that should be offered.

Thank you for your cooperation.

APPENDIX B

LETTER TO GRADUATES

Iowa Tech
Ottumwa Industrial Airport
Ottumwa, Iowa

To: Iowa Tech Alumni

From: Bernard Terill, Coordinator
Computer Maintenance Division

Subject: Follow-up and Evaluation

Gentlemen:

Several of you have already participated in an earlier follow-up of Iowa Tech Computer Maintenance graduates and your cooperation was appreciated. Your answers and comments were studied carefully in order to make changes that would improve our curriculum.

At this time we again request the assistance of our graduates in providing the Computer Maintenance department with an up-to-date, more comprehensive evaluation of the program. Any comments you wish to make would be invited. Even though this follow-up is more extensive than the previous one, we have tried to keep it brief enough to take only a few minutes of your valuable time.

Thank you
Bernard Terrill

Department Head

P.S.
Graduates not working in the computer field who wish to be employed in this capacity are urged to contact the school.

Again your cooperation would be appreciated.

APPENDIX C

POST CARD REMINDER

Dear Alumnus:

I know you are very busy at this time of year, but this is just a reminder that a questionnaire has been sent to you from Iowa Tech. If you have not mailed it, please take a few minutes to complete the form and return it.

Thank you

Bernard Terrill
Department Head